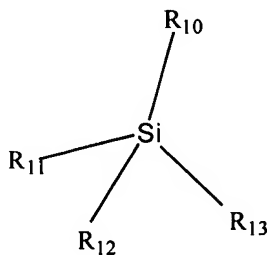


## IN THE CLAIMS

Please amend the following claims:

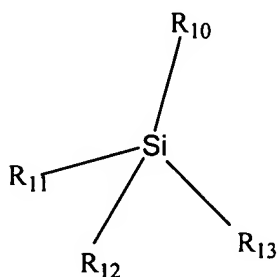
- 1-26. Canceled.
27. (New) Gas layer formation material selected from the group consisting of acenaphthylene homopolymers; acenaphthylene copolymers; norbornene and acenaphthylene copolymer; polynorbornene derivatives; blend of polynorbornene and polyacenaphthylene; poly(arylene ether); polyamide; B-staged multifunctional acrylate/methacrylate; crosslinked styrene divinyl benzene polymers; and copolymers of styrene and divinyl benzene with maleimide or bis-maleimides.
28. (New) The gas layer formation material of claim 27 having less than two percent weight loss after holding at 300°C for one hour.
29. (New) The gas layer formation material of claim 27 additionally comprising an adhesion promoter.
30. (New) The gas layer formation material of claim 27 additionally comprising silane of the following formula:



where R<sub>10</sub>, R<sub>11</sub>, R<sub>12</sub>, and R<sub>13</sub> is the same or different and selected from the group consisting of hydrogen, alkyl, aryl, alkoxy, aryloxy, acetoxy, chlorine, or combinations

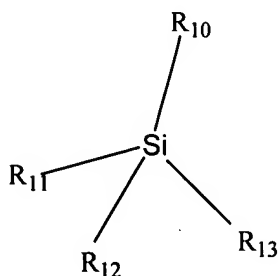
thereof, and where at least one of  $R_{10}$ ,  $R_{11}$ ,  $R_{12}$ , and  $R_{13}$  is alkoxy, aryloxy, acetoxy, or chlorine; organosiloxane; phenylsiloxane polymer; methylphenylsiloxane polymer; siloxane polymer; hydrogen silsesquioxane; or methyl silsesquioxane.

31. (New) A spin-on depositable material comprising said gas layer formation material of claim 27.
32. (New) A chemical vapor deposition precursor comprising said gas layer formation material of claim 27.
33. (New) A film comprising said gas layer formation material of claim 27.
34. (New) A substrate having said film of claim 33 thereon.
35. (New) A method of forming a gas layer comprising the step of: using a gas layer formation material selected from the group consisting of acenaphthylene homopolymers; acenaphthylene copolymers; norbornene and acenaphthylene copolymer; polynorbornene derivatives; blend of polynorbornene and polyacenaphthylene; poly(arylene ether); polyamide; B-staged multifunctional acrylate/methacrylate; crosslinked styrene divinyl benzene polymers; and copolymers of styrene and divinyl benzene with maleimide or bis-maleimides.
36. (New) The method of claim 35 wherein said material has less than two percent weight loss after holding at 300°C for one hour.
37. (New) The method of claim 35 wherein said material additionally comprises adhesion promoter.
38. (New) The method of claim 35 wherein said material additionally comprises silane of the following formula:



where  $R_{10}$ ,  $R_{11}$ ,  $R_{12}$ , and  $R_{13}$  is the same or different and selected from the group consisting of hydrogen, alkyl, aryl, alkoxy, aryloxy, acetoxy, chlorine, or combinations thereof, and where at least one of  $R_{10}$ ,  $R_{11}$ ,  $R_{12}$ , and  $R_{13}$  is alkoxy, aryloxy, acetoxy, or chlorine; organosiloxane; phenylsiloxane polymer; methylphenylsiloxane polymer; siloxane polymer; hydrogen silsesquioxane; or methyl silsesquioxane.

39. (New) A process comprising the steps of:
- (a) in an inter-level dielectric layer, incorporating a polymer having:
    - (i) a glass transition temperature of greater than about 200°C, (ii) less than two percent weight loss after holding at 300°C for one hour, and (iii) a decomposition temperature of greater than about 350°C;
  - (b) heating said polymer to a temperature of greater than about 350°C; and
  - (c) removing the heated polymer.
40. (New) The process of claim 39 wherein said polymer additionally comprises adhesion promoter.
41. (New) The process of claim 39 wherein said polymer additionally comprises silane of the following formula:



where  $R_{10}$ ,  $R_{11}$ ,  $R_{12}$ , and  $R_{13}$  is the same or different and selected from the group consisting of hydrogen, alkyl, aryl, alkoxy, aryloxy, acetoxy, chlorine, or combinations thereof, and where at least one of  $R_{10}$ ,  $R_{11}$ ,  $R_{12}$ , and  $R_{13}$  is alkoxy, aryloxy, acetoxy, or

- chlorine; organosiloxane; phenylsiloxane polymer; methylphenylsiloxane polymer; siloxane polymer; hydrogen silsesquioxane; or methyl silsesquioxane.
42. (New) The process of claim 39 additionally comprising prior to said step (b), treating said polymeric layer by exposure to electron beam radiation, ion beam radiation, microwave radiation, ultraviolet radiation, infrared radiation, or x-ray.
43. (New) A microchip comprising a gas layer wherein the gas layer is formed by:
- (a) forming a layer of polymer on a substrate having:
    - (i) a glass transition temperature of greater than about 200°C, (ii) less than two percent weight loss after holding at 300°C for one hour, and (iii) a decomposition temperature of greater than about 350°C;
  - (b) decomposing the polymeric layer; and
  - (c) volatilizing the decomposed polymeric layer wherein the gas layer forms.
44. (New) A microelectronic device comprising:
- (a) substrate;
  - (b) a layer of thermally degradable polymer having a glass transition temperature of at least 200°C and is capable of being degraded and volatilized;
  - (c) porous capping layer adjacent to said polymeric layer; and
  - (d) metal barrier layer adjacent to the ends of said polymeric layer.
45. (New) A process for forming a microelectronic device comprising the steps of:
- (a) applying thermally degradable polymer having a glass transition temperature of at least 200°C on a substrate;
  - (b) applying a porous capping layer on said thermally degradable polymer layer;
  - (c) patterning said thermally degradable polymer and porous capping layers;
  - (d) applying metal barrier layer to said patterned layer;
  - (e) thermally degrading said polymer; and

- (f) volatilizing said degraded polymer to form a gas layer.
46. (New) The process of claim 45, additionally comprising prior to said step (e), treating said thermally degradable polymer by exposure to electron beam radiation, ion beam radiation, microwave radiation, ultraviolet radiation, infrared radiation, or x-ray.